

Anall
side of said first substrate, and

wherein an electrical connection is established between said driver circuit and said electrical element by at least one silver paste or at least one electrically conductive spacer.--

REMARKS

Reconsideration and allowance of this application are respectfully requested.

The interview with Examiner K. Parker on May 25, 1999 with Dr. S. Yamazaki; K. Yamamoto; H. Sunagawa; K. Morikawa; G. Ferguson; and the undersigned in attendance is acknowledged with appreciation.

As discussed at the interview, the claims have been amended to recite one or both of the following features. The first feature is illustrated in Figure 3, for example, where the inlet 15 for the introduction of liquid crystal material is disposed at a side edge of the substrate 10 at which there is no drive circuit. That is, drive circuits 13 are disposed at side edges of the substrate 10 which are removed from the side where the inlet port 15 is disposed. Thus, when the liquid crystal material is introduced into the pixel region 12, it will not pass over any of the drive circuitry 13. It is applicants' understanding that if the liquid crystal material were to pass over the drive circuitry as it was being introduced into the pixel area, there may be a tendency for electrostatic charge to accumulate on the drive circuitry with the resulting possibility of damage to the drive circuitry. Accordingly, in accordance with the first feature of the amended claims, the foregoing possible problem is avoided by disposing inlet port 15 at a side of substrate 10 where there is no drive circuitry. Hence, the injected liquid crystal

material will not pass over the drive circuitry.

In accordance with a second feature of the amended claims, an electrical connection between drive circuitry on the first substrate and an electrical element on the second substrate may be established by using at least one silver paste or at least one electrically conductive spacer where the electrical element on the second substrate may be another driver circuit, as discussed at page 15, penultimate line through page 16, line 4, or another element such as a counterelectrode, etc. on the second substrate. The use of the silver paste or electrically conductive spacer to establish the foregoing electrical conduction may be advantageous if the silver paste or electrically conductive spacer is disposed within a sealing member enclosing the pixel circuitry and the driver circuitry where the sealing member seals liquid crystal material between the first and second substrates. That is, if the silver paste or electrically conductive spacer is disposed within the sealing member, the overall size of the electro-optical device may be reduced.

Amended claims 25 and 40 and new claim 47 recite the above discussed first feature; amended claims 30 and 41 and new claim 48 recite the above second feature; and amended claims 35 and 42 and new claim 49 recite both of the foregoing features. Moreover, all of the claims have been amended to delete the recitation wherein the first and second substrates are substantially aligned with each other at the side where the inlet is provided for injecting liquid crystal material between the first and second substrates.

Claims 25, 40, and 47, directed to the foregoing first feature, distinguish over the following references of record as follows. Referring to Swatsubashi et al., column 7, lines 44-55, it is there discussed that data and gate line driving circuits may be respectively formed on either the upper or lower edge portions of

the substrates or on the left or right edge portions of the substrates so that the data and gate lines are driven by a single data line driving circuit and a single gate line driving circuit respectively. However, there is a failure on the part of Swatsubashi et al. to appreciate that no driving circuit should be disposed at the edge of the substrate where the liquid crystal material inlet 108a is disposed and thus, it is urged that claims 25, 40, and 47 distinguish over Swatsubashi where, as is discussed above, these claims recite that the inlet port for the liquid crystal material is disposed at an edge of the substrate where no driver circuitry is present.

With respect to the Hu et al. reference, a verified English translation of Japanese priority document No. 5-256571 will be prepared and promptly filed to avoid this reference.

With respect to the Niki reference, it is applicants' understanding that there is no disclosure of drive circuitry on the substrate 110 and thus claims 25, 40, and 47 distinguish over this reference because, as discussed above, these claims are directed to the presence of drive circuitry on the substrate except for at least one side thereof. Accordingly, it is urged these claims also distinguish over the Niki reference.

With respect to the Matsuo reference, it is applicants' understanding that the liquid crystal material is introduced through port 14 (see Figure 1(a)) into the pixel space 12. Although the liquid crystal material does not come into contact with the drive circuits 5 and 6, claims 25, 40, and 47 distinguish over this reference in that in these claims the injection port is disposed at the side edge of the first and second substrates whereas, as can be seen from Figure 1(a) of Matsuo, the injection port 14 extends through the upper substrate 10. Hence, the structure of the Matsuo device is different from that of the present invention.

In view of the foregoing remarks, it is urged claims 25, 40, 47, and the claims dependent thereon are distinguished with respect to the foregoing references and thus recite patentable subject matter.

Referring to claims 30, 41, and 48 which are directed to the above discussed second feature, it is applicants' understanding that at least the Matsuo, Swatsubashi et al., and Niki references do not disclose the aforesaid feature. In this regard, submitted herewith is a copy of U.S. Patent No. 5,130,833 assigned to the assignee of the subject application, this reference being listed in the Information Disclosure Statement submitted herewith. This reference is directed to the use of a conductive material such as an anisotropic conductive film comprising UV light curable adhesive 8 in which a number of conductive particles are dispersed. As discussed at column 4, lines 3-31, first and second substrates 1 and 2, upon which are disposed orthogonal electrode strips 9, are connected to auxiliary substrates 3, upon which are disposed driver circuits for driving the electrode strips 9, where liquid crystal material is injected into the space between substrates 1 and 2 and sealed therein by an adhesive, as described at column 3, lines 38-45.

As can be appreciated from the foregoing, there is no disclosure of the structure of claims 30, 41, and 48 where the pixel (active matrix circuitry) and driver circuitry are mounted on the same first substrate and enclosed by a sealing member wherein an electrical connection is established between the driver circuitry and an electrical element on the second substrate by at least one silver paste or at least one electrically conductive spacer. As discussed above, in a structure of the foregoing type, the silver paste or electrical conductive spacer can be incorporated within the aforesaid sealing member and thus realize potential reduction in the overall size of the electro-optical device, it being understood that

in claims 30, 41, and 48, the silver paste or electrically conductive spacer may be disposed within the sealing member or spaced therefrom. In conclusion, it is urged claims 30, 41, and 48 and the claims dependent thereon are also patentably distinguishable with respect to the foregoing references.

With respect to claims 35, 42, and 49 these claims recite both of the above-mentioned features and hence these claims and the claims dependent thereon are distinguishable over the above-discussed references for all of the reasons mentioned above.

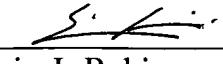
Furthermore, new claims 47-49, in addition to reciting the above discussed features of the amended claims in various combinations also recite the feature of dependent claim 27 wherein the sealing member overlaps at least a part of the driver circuit. Thus, since the sealing member and driver circuits at least partially occupy the same space, reduction of the overall size of the electro-optical device may also be effected in this manner. In this regard, it is noted Swatsubashi discloses at least partial overlap of the sealing member and the driver circuit. In any event, it is urged claims 47-49 distinguish over this reference for the reasons discussed above. Accordingly, it is urged these claims are distinguishable over the above references.

The allowability of claims 43 and 44 is noted with appreciation. These claims correspond to former claims 12 and 17 (which have now been cancelled to thus avoid the double patenting rejection in the outstanding Office Action) where claims 12 and 17 were indicated as allowable in the Office Action of June 30, 1997. Due to a typographical error, claim 43 which corresponds to claim 12 written in independent form, is in error. Accordingly, by this amendment, claim 43 has been amended to eliminate the typographical error therein.

In view of the foregoing amendments and remarks, it is urged this case is

now in condition for allowance and a notice to that effect is requested.

Respectfully submitted,


Eric J. Robinson
Registration No. 38,285

Sixbey, Friedman, Leedom & Ferguson, P.C.
8180 Greensboro Drive, Suite 800
McLean, Virginia 22102
(703) 790-9110